

WHAT IS CLAIMED IS:

- pub 681
- 1 1. A controlled debris perforating system, comprising:  
2 a pre-fragmented shaped charge having a charge case and an explosive  
3 material.
- 1 2. The controlled debris perforating system of claim 1, wherein the charge  
2 case defines at least one slot.
- 1 3. The controlled debris perforating system of claim 2, wherein the at least  
2 one slot is axially oriented.
- 1 4. The controlled debris perforating system of claim 2, wherein the at least  
2 one slot is circumferentially oriented.
- 1 5. The controlled debris perforating system of claim 2, wherein the at least  
2 one slot is a U-notched groove.
- 1 6. The controlled debris perforating system of claim 2, wherein the at least  
2 one slot is a V-notched groove.
- 1 7. The controlled debris perforating system of claim 2, wherein the at least  
2 one slot is an external slot.
- 1 8. The controlled debris perforating system of claim 2, wherein the at least  
2 one slot is an internal slot.
- 1 9. A method of controlling the debris during perforating, comprising:  
2 providing a pre-fragmented shaped charge having a charge case defining a  
3 plurality of grooves.
- 1 10. The method of claim 9, wherein the plurality of grooves are axially  
2 oriented.
- pub 682
- 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

1 11. The method of claim 9 <sup>B</sup> wherein the plurality of grooves are  
2 circumferentially oriented.

1 12. A shaped charge made by a process, comprising:  
2 inserting an explosive into a case;  
3 inserting a liner over the main body of explosive; and  
4 machining a plurality of slots in the case.

1 13. The shaped charge made by the process of claim 12, wherein the plurality  
2 of slots are U-notched grooves.

1 14. The shaped charge made by the process of claim 12, wherein the plurality  
2 of slots are V-notched grooves.

1 15. The shaped charge made by the process of claim 12, wherein the plurality  
2 of slots are machined externally.

1 16. The shaped charge made by the process of claim 12, wherein the plurality  
2 of slots are machined internally.

1 17. A method of using one or more pre-fragmented shaped charges in a well,  
2 comprising:  
3 providing a perforating string having one or more pre-fragmented shaped  
4 charges; and  
5 conveying the perforating string into the well.

1 18. The method of claim 17, wherein the perforating string comprises a  
2 loading tube and carrier.

1 19. The method of claim 17, wherein the perforating string comprises a spiral  
2 gun.

1 20. The method of claim 17, wherein the perforating string comprises a strip  
2 gun.